

MONTHLY WEATHER REVIEW,

NOVEMBER, 1873.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE

STORMS.

During the month of November twelve storms traversed the Territory of the United States; the storm-centres of all these, with one exception, moving within the region covered by the Signal Office Observations.

The following brief notices give the main facts of each storm:

No. I. Approached from the neighborhood of Pembina, on the 1st of November, and, after moving to the southern shore of Lake Superior, preserved an easterly course, reaching the Atlantic ocean, north of Nova Scotia, on the evening of the 3d. Its mean progressive velocity was therefore from twenty-five to thirty miles per hour, although its cyclonic winds were not very dangerous.

No. II. Followed nearly the same track, but attained somewhat higher velocity. It arrived in Northern Minnesota on the afternoon of the 3d of November, and reached the St. Lawrence valley on the evening of the 4th. It was accompanied by rain and light snow on the Lakes and eastward.

No. III. Coming from the Red River valley on the 6th, and crossing the Lakes, reached Kingston, Canada, on the morning of the 8th, and thence moved northeastwardly.

No. IV. Originated in the western part of the Gulf of Mexico, and moved along the Gulf and Atlantic coasts all the way to Nova Scotia. It started upon this track on the morning of the 6th, and reached Plaister Cove, Nova Scotia, on the morning of the 9th, averaging about thirty-two miles an hour. It was accompanied by fresh wind and rain on the seaboard, and on reaching the Maine coast it was marked by high and dangerous winds in its front. As usual with cyclones taking this track, as it neared Nova Scotia, the barometric depression increased and the cyclonic winds became more violent than when the meteor was moving on lower parallels of latitude.

No. V. Probably originated in Colorado, near the eastern slope of the Rocky Mountains, but was first seen in Kansas on the afternoon of the 10th, and moved first northward to St. Paul, Minnesota; thence on the 11th toward Milwaukee, sweeping eastward with destructive force over the Lakes, and thence to the northeastward. At Milwaukee the gale rose to thirty-two miles an hour, accompanied by high winds and heavy snow on Lake Michigan; and snow and rain on the other Lakes.

No. VI. November 16th, commenced its southeastwardly progress from Lake Superior (nearly due southeast) to Boston, passing over the latter place on the evening of the 16th, with heavy snow.

No. VII. Was perhaps the most remarkable continental cyclone of which the Signal Office observations furnish any details. It was generated about mid-day of the 16th, in Northern Georgia, and at once assumed a threatening aspect. During the night of the 16th and morning of the 17th, it steadily advanced to the vicinity of Wilmington, making about two hundred and forty miles in twelve hours, or about twenty miles an hour. Its course was thence northeastward along the inshore margin of the Gulf stream, which it tenaciously followed to latitude 43° north, whence it struck off into the Bay of Fundy, and thence to the mouth of the St. Lawrence river. All along, its track was marked, from Norfolk to Halifax and Father Point, by fierce gales, and the incoming vessels reported fearful seas off the coast. At Norfolk the barometer fell to 28.86 inches with rapidly shifting northeast, north, and northwest winds of high velocity on the 17th. Chimneys and fences were blown down, and the shipping in the harbor in many instances dragged their anchors. In the Chesapeake bay it was extremely severe. At Cape May the wind rose to forty miles, and the barometer fell to 28.76, with very heavy sea, reported by pilots from outside the worst gale known for years. At New Haven, on the morning of the 18th, the barometer fell to 28.72, (with increasing storm,) and at Wood's Hole to 28.60, and 28.61 at Boston, and 28.49 at Portland, Maine—the lowest observed barometers at the last-named points since they became signal stations. At Eastport, Maine, at about 6 a. m., on the 18th, the cyclone attained terrific force, its wind blowing 64 miles an hour. Its progress over the Canadian districts to the northward and eastward was equally violent. Its whole course was marked by heavy rain and snow, and its cyclonic indraught extended from the Middle Atlantic coast to the Upper Lakes.

No. VIII, First appeared in the Middle Missouri Valley on the 20th, and moved east to Toledo, whence its course was northeastward, and it soon disappeared.

No. IX. Was also of minor importance, having begun in Northern Lake Superior, and soon disappearing to the northeastward.

No. X. Appears to have been generated near Santa Fe on the 22d, and thence moved toward Western Texas, from which locality, on the 23d, it advanced into the Lower Ohio Valley. Its course thence was in nearly a straight line to Halifax, where it is lost sight of. It was preceded by much rain and snow on the Lakes, and high winds on the New England coast.

Nos. XI and XII First appeared in the Northwest, on the 23d and 26th of November, respectively, and moved first southeastwardly to Michigan and the Lower Lakes, and thence northeastwardly, with brisk but not very high winds, and frequent rains and snows.

ANTI-CYCLONIC AREAS.

There have been eight decided areas of high barometer passing over the United States during the past month. These anti-cyclonic areas have first appeared in the Rocky Mountain region, and advanced southeastwardly. It is observable that as the

season progressed they have selected pathways of higher latitude ; and moreover, their intensity has increased. As these barometric waves have advanced and spread out from the Northwest and West, toward the Alleghanies; the pressure rather increased than diminished. Their front has been distinguished as well by low temperatures, heavy snows and rains, as by high barometer readings ; and generally they have given rise to high northerly winds in their front, and high southerly winds in their rear, the atmospheric mass drawing around the crest in the direction of the hands of a clock. The very high pressure of the 27th-30th of November while in the Northwest, by retarding the advance of the storm-centre on its western side, until the pressure over the Rocky Mountains could accumulate, apparently explains the violence of the storm that has since passed over the Lakes. The course of these waves may be discerned on Map No. 2 by the isobaric lines.

TEMPERATURE.

The November temperature has been much lower than usual in New England ; and generally lower over the whole country east of the Rocky Mountains. In the Lower Mississippi, the Lower Missouri valleys, and the Gulf States the normal temperature has prevailed. The variation from the normal in the Ohio valley and Tennessee has been very little—1° 2' below. The thermometric means will be found on Map No. 2, which gives the isothermal lines. The lowest temperature reported (except from mountain stations) was—22° at Pembina.

PRECIPITATION.

Map No. 3 gives approximately the rainfall for the different sections this side of the Rocky Mountains. The marginal table on the map explains where there has been abnormal excess or deficiency. The official report from Yankton, Dakota, shows that there has been hardly any appreciable rainfall in that section during the entire month. The greatest precipitation was in Southeastern Massachusetts and near Galveston.

RIVERS.

The Red river was highest above low-water mark on the 25th, when its rise was 13 feet 3 inches. The Missouri reached its highest between the 20th and 27th. The Upper Mississippi on the 28th, when it was five feet above low-water mark at St. Paul, and 8 feet 6 inches at St. Louis. At Cairo, on the 29th, the Mississippi maximum was 14.9 above low-water. At New Orleans, on the 1st, it was 13 feet and 4 inches below high-water mark. The Cumberland, at Nashville, and the Ohio, at Cincinnati, on the 28th, were over twenty feet above low-water.

The lowest fall of the Ohio was on the 12th, when at Cincinnati it was 8 feet ; that of the Mississippi on the 19th, at Cairo, 6 feet 6 inches ; that of the Red river on the 20th, at Shreveport, 6 feet 3 inches.

PECULIAR PHENOMENA.

The display of auroras in the Lake region does not seem to have been as frequent or as brilliant as usual ; nor have the November cyclonic disturbances been as numerous or as marked as usual during the past month. At New York, on the 22d, the peculiar arrangement of cirrus clouds, known as the "Polar Bands," was reported by the Obser-

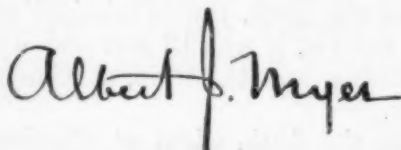
ver; the "Bands" extending from the southwest to the northeast, covering nearly the entire sky and apparently converging at the two points mentioned; and the whole attenuated mass was moving rapidly to the northeastward. On the 29th two "mock suns" were observed, one on either side of the sun, at an altitude of about 5°. At Buffalo, on the 1st, the unusual phenomenon of a vivid flash of "blue light" was observed over the Lake, accompanied by a loud report as of a cannon; supposed by the observer to be a "lightning ball." During the storm of the 17th, the Lake City, Fla., observer reports the electric phenomena very protracted and persistent toward the southeast, showing its connection with the Gulf Stream off the Florida coast. The Nashville observer, on the nights of the 13th and 14th, kept up meteoric observations and saw a number of shooting stars. The Marquette observer, during this month, has conducted an interesting investigation to ascertain what, if any, connection exists between barometric fluctuations and the rise and fall of the water in Lake Superior. The St. Paul observer, on the 3d, reported the "Bands" of fine cirri at 10.30 p. m., extending from west to east, through which the moon appeared surrounded with two rings, showing the prismatic colors very distinctly. The Lexington, Ky., observer reports unusual smokiness in his section—a phenomenon which has largely extended over the Lakes and is a characteristic of the Indian summer.

The first ice at Savannah was formed on the 20th of November. On the 17th the barometer fell .167 of an inch at Leavenworth, and read 29.33, the lowest reading given since last April. The observer at Leavenworth reports first ice floating in the river on the 29th. The enormous rainfall of 6.35 inches in forty-eight hours, on the 24th, was reported by the observer at Shreveport.

STORM-WARNING SIGNALS.

Seventy-seven (77) Cautionary Signals were displayed during the month at ports in the United States and forty-four (44) at Canadian ports. The office has no returns to show how many of the signals displayed at Canadian points were justified. Out of the seventy-seven storm-warnings displayed at United States ports there were four whose justification was doubtful; but the number known to have been *actually justified* was 62. This gives as the percentage of verification 80.51.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.



Brig. Gen. (Bvt. Assg^d.) Chief Signal Officer, U. S. A.

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WAR DEPARTMENT

SIGNAL SERVICE

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF THE

RAIN CHART FOR NOVEMBER

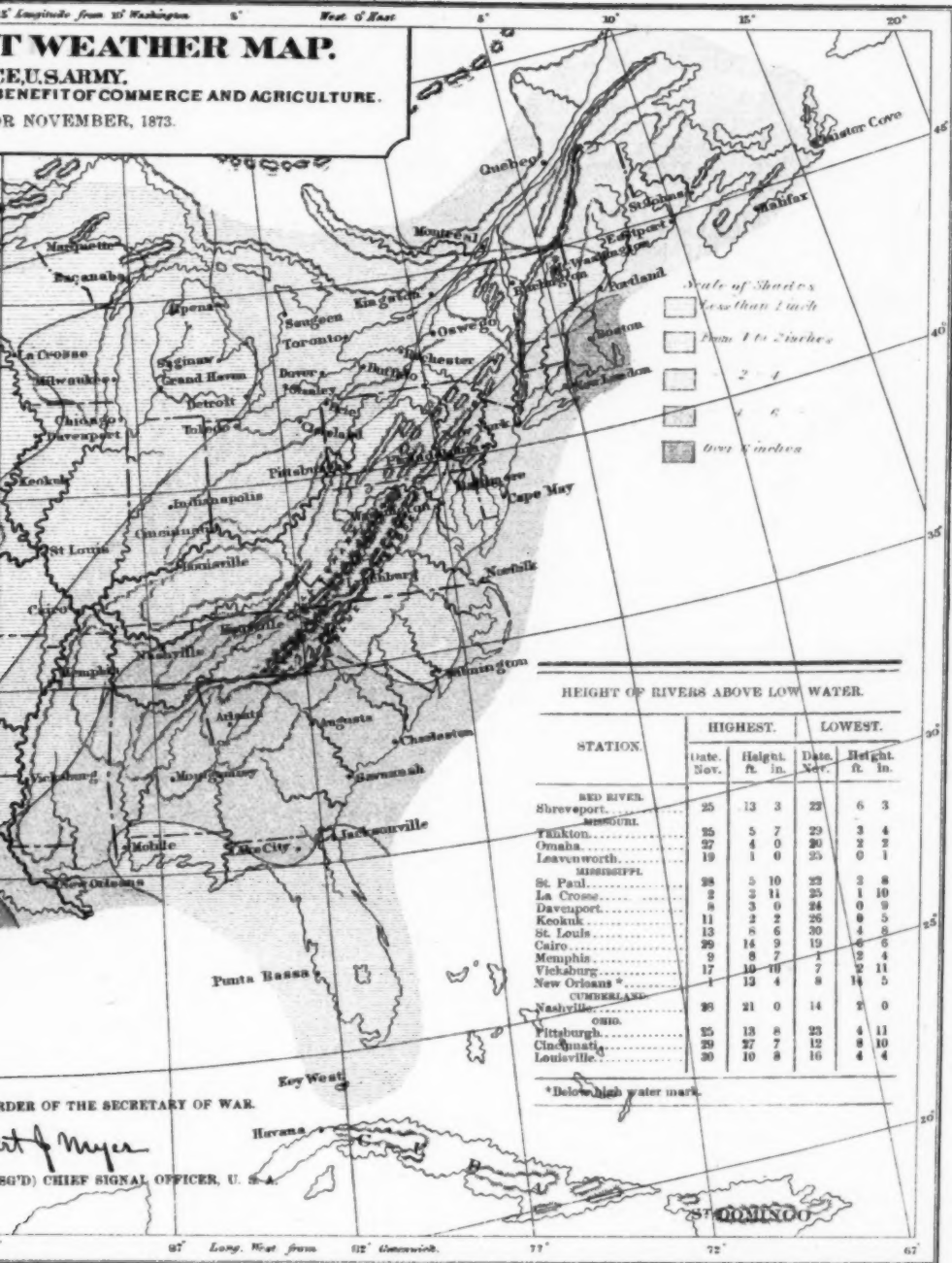
AVERAGE PRECIPITATION FOR NOVEMBER, 1891

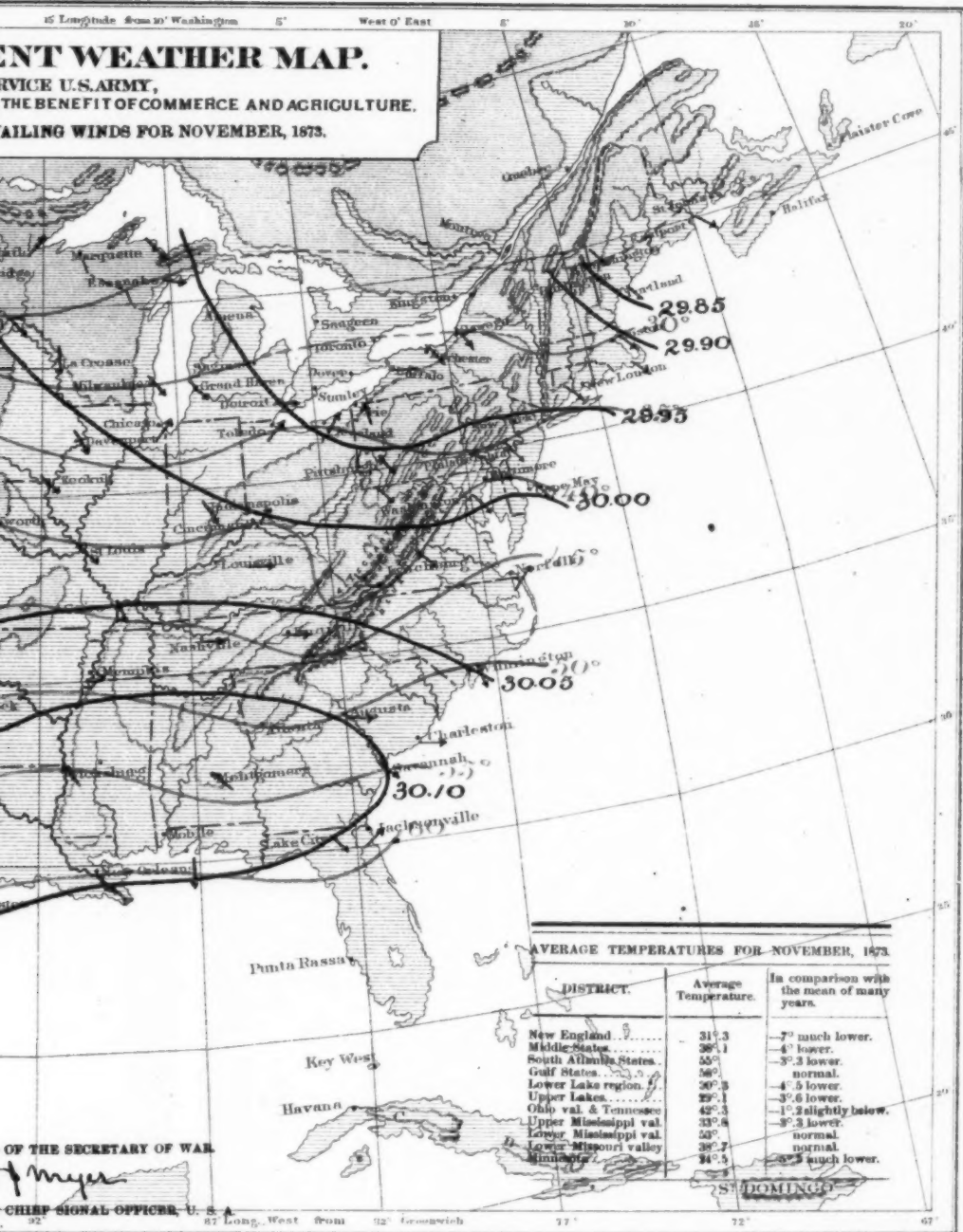
DISTRICT.	Amount Inches.	Compared with the mean amount for November.
St. Lawrence valley...	4.5	or a small excess
New England.....	5.4	or an excess
Middle Atlantic States...	3.9	or a small excess
South Atlantic States...	4.4	or an excess
Eastern Gulf States...	3.2	or a deficit
Western Gulf States...	3.8	or an excess
Upper Lake region...	1.8	or a deficiency
Lower Lake region...	2.4	or a deficiency
Ohio valley.....	2.3	or a deficiency
Tennessee.....	4.4	or an excess
Upper Mississippi val.	1.2	or a deficiency
Lower Mississippi val.	3.9	or a normal
Lower Missouri valley	0.7	or a large deficiency
Minnesota.....	1.0	or a deficiency

PUBLISHED BY ORDER

 Albert
 BRIG. GEN. (BVT. ASSG'D)

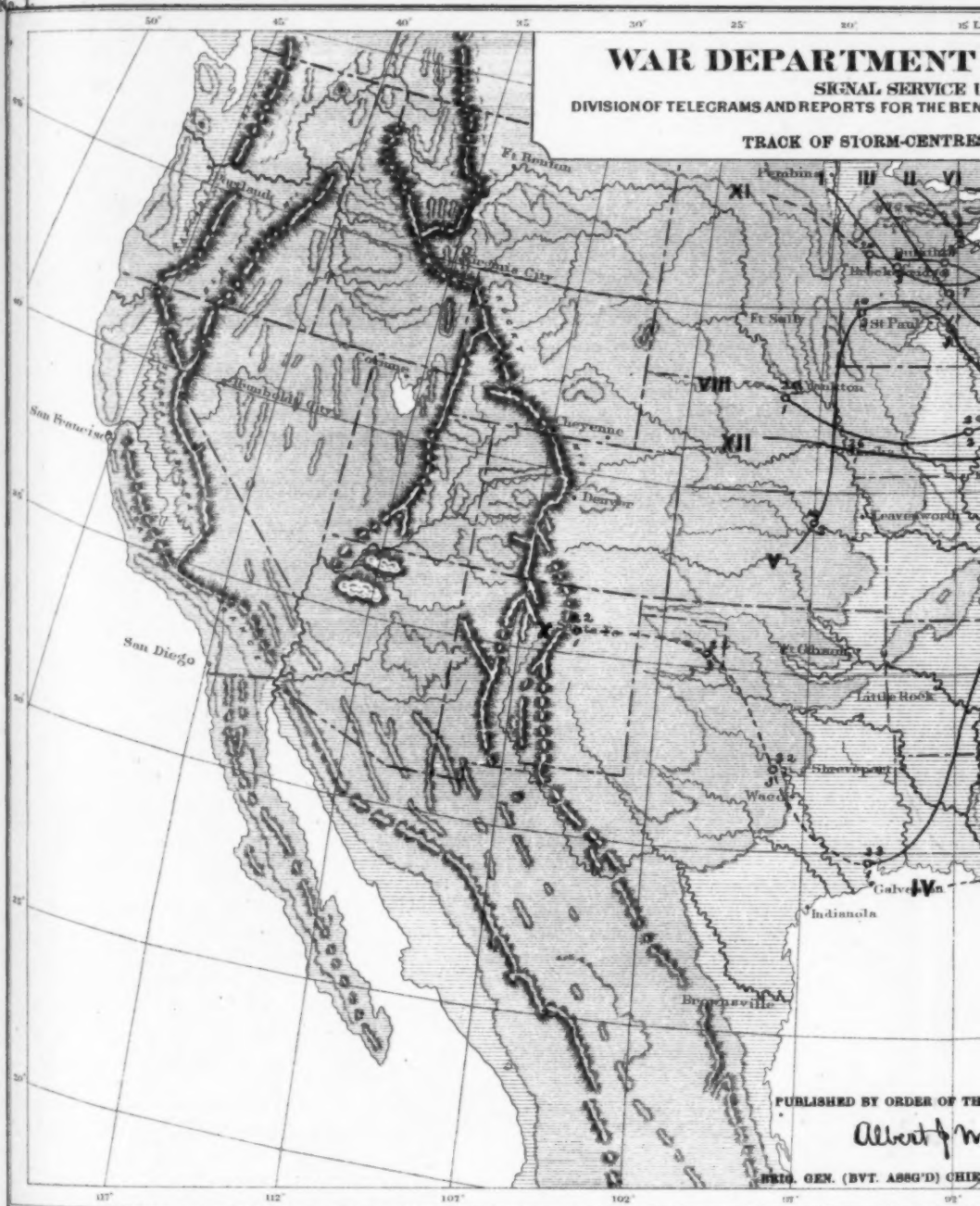
5° Longitude from 10° Washington 5° West of East 5° 10° 15° 20°
WEATHER MAP.
 U.S. ARMY.
 BENEFIT OF COMMERCE AND AGRICULTURE.
 NOVEMBER, 1873.





AVERAGE TEMPERATURES FOR NOVEMBER, 1873.

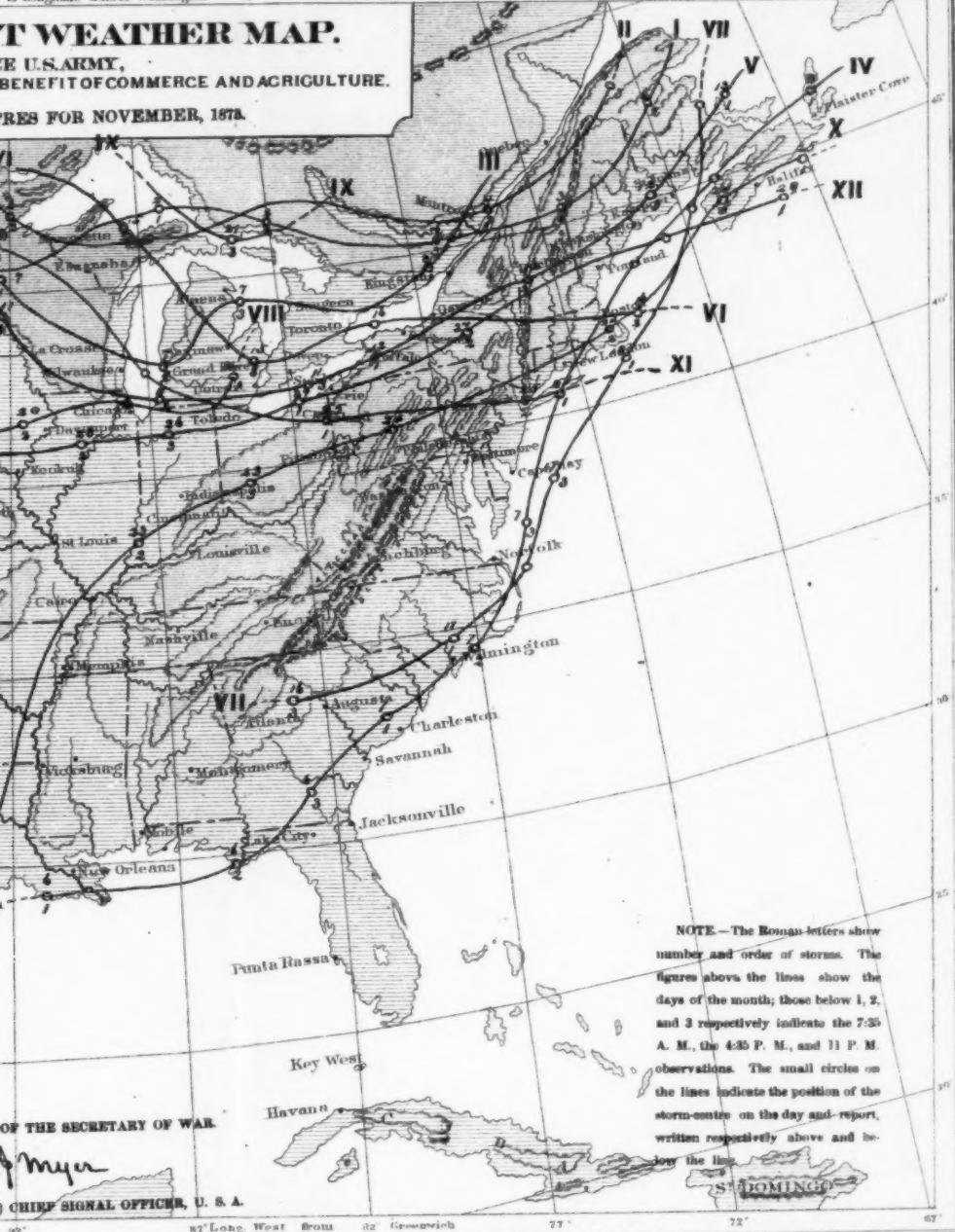
DISTRICT.	Average Temperature.	In comparison with the mean of many years.
New England	31° 3	-7° much lower.
Middle States	36° 1	-4° lower.
South Atlantic States.	55°	-3° 3 lower.
Gulf States	56°	normal.
Lower Lake region ..	30° 3	-4° 5 lower.
Upper Lakes	29° 1	-3° 6 lower.
Ohio val. & Tennessee	42° 3	-1° 2 slightly below.
Upper Mississippi val.	33° 6	-3° 3 lower.
Lower Mississippi val.	53°	normal.
Lower Missouri valley	38° 7	normal.
Minnesota	34° 3	-3° 3 much lower.



15 Longitude from 10° Washington 5° West of East 10° 15° 20°

WEATHER MAP.

THE U.S. ARMY,
IN BENEFIT OF COMMERCE AND AGRICULTURE.
PRES FOR NOVEMBER, 1878.



NOTE - The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below 1, 2, and 3 respectively indicate the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-center on the day and report, written respectively above and below the line.

OF THE SECRETARY OF WAR.

CHIEF SIGNAL OFFICER, U. S. A.

92° 87° Long. West from 32° Greenwich 77° 72° 67°

U.S. Signal Service Lith.